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PTO IDENTIFIER: Application Number 09/766,736-Conf. #1298

Patent Number

Inventor: Edward J. Bortolini et al.

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Application No. (if known): 09/766,736

Attorney Docket No.: 013436.0235PTUS  
(Bortolini 6-7-1)

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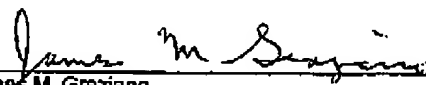
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TRANSMITTAL OF APPEAL BRIEF		Docket No. 013436.0235PTUS (Bortolini 6-7-1)	
In re Application of: Edward J. Bortolini et al.			
Application No. 08/766,736-Conf. #1298	Filing Date January 22, 2001	Examiner U. Raman	Group Art Unit 2611
Invention: DISTRIBUTED BROADBAND CABLE MODEM TERMINATION SYSTEM			
<p style="text-align: center;"><b><u>TO THE COMMISSIONER OF PATENTS:</u></b></p> <p>Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: <u>January 4, 2007</u>.</p> <p>The fee for filing this Appeal Brief is <u>\$ 500.00</u>.</p> <p><input checked="" type="checkbox"/> Large Entity      <input type="checkbox"/> Small Entity</p> <p><input type="checkbox"/> A petition for extension of time is also enclosed.</p> <p>The fee for the extension of time is _____.</p> <p><input type="checkbox"/> A check in the amount of _____ is enclosed.</p> <p><input type="checkbox"/> Charge the amount of the fee to Deposit Account No. <u>50-1848</u>.</p> <p><input checked="" type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input checked="" type="checkbox"/> The Director is hereby authorized to charge any additional fees that may be required or credit any overpayment to Deposit Account No. <u>50-1848</u>.</p> <p>This sheet is submitted in duplicate.</p> <p style="text-align: right;">Dated: <u>05 February 2007</u></p> <p><u>James M. Graziano</u> James M. Graziano Attorney Reg. No. : 28,300 PATTON BOGGS LLP 1660 Lincoln Street, Suite 1900 Denver, Colorado 80264 (303) 830-1776</p>			

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TRANSMITTAL OF APPEAL BRIEF		Docket No. 013436.0235PTUS (Bortolini 6-7-1)	
In re Application of: Edward J. Bortolini et al.			
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
ON APPEAL BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of:  
Edward J. Bortolini et al.

Appellant: Lucent Technologies, Inc.

Application No.: 09/766,736

Confirmation No.: 1298

Filed: January 22, 2001

Art Unit: 2611

For: DISTRIBUTED BROADBAND CABLE  
MODEM TERMINATION SYSTEM

Examiner: U. Raman

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Dear Sir:

APPELLANT'S APPEAL BRIEF

Appellant's Appeal Brief was timely filed pursuant to 37 CFR §1.192 because it was filed within two months of 04 January 2007, which is the date on which Appellant filed their Notice of Appeal.

Appellant believes that the claims appealed are patentable as argued in the Appeal Brief. If the Examiner has any questions concerning the Appeal Brief or the Arguments presented in the Appeal Brief and feels that an interview pursuant to MPEP Sections 713.05 and 713.09 may be helpful in resolving the issues on appeal, attorneys for the Appellant would urge the Examiner to contact the attorneys for Appellant to arrange such an interview, even if the refiling of this application is necessary for this purpose.

Appellant's attorneys respectfully solicit the Board to remand this case to the Examiner with instructions to allow the case pursuant to 37 CFR §1.197(a).

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Appellant's admitted prior art system as disclosed in Figure 2 of the disclosure

## OUTLINE OF APPEAL BRIEF

### 1.) REAL PARTY IN INTEREST

The party named in the caption of the Appeal Brief is Lucent Technologies, Inc.

A full list of inventors is: Edward J. Bortolini, Chia Chang Li, and Roger W. Loots.

The subject matter of the invention was derived from research efforts undertaken by Edward J. Bortolini, Chia Chang Li, and Roger W. Loots in March 2000.

The rights to the present invention were assigned by the inventors, Edward J. Bortolini, Chia Chang Li, and Roger W. Loots in an Assignment document dated 04 December 2000, 12 December 2000, and 15 January 2001, respectively, filed on 22 January 2001, recorded at Reel 011498, Frame 0078 on 22 January 2001, and re-recorded at Reel 011788, Frame 0313 on 07 May 2001.

The real party of interest is accordingly Lucent Technologies, Inc., because Lucent Technologies, Inc. owns the entire right, title, and interest to the present invention.

### 2.) RELATED APPEALS AND INTERFERENCES

Currently, no appeals or interferences are known by any party.

### 3.) STATUS OF THE CLAIMS

Claims 1, 6, and 11 - 24 are pending and all are rejected. In the Final Office Action mailed 19 October 2006, claims 6 and 21 - 24 have been rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. Claims 1, 6, and 11 - 24 have been further rejected under 35 USC §102(b) as being anticipated by Appellant's admitted prior art system as disclosed in Figure 2 of the disclosure.

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#### 4.) STATUS OF AMENDMENTS

No amendments have been filed since receipt of the FINAL Office Action dated 19 October 2006.

#### 5.) SUMMARY OF CLAIMED SUBJECT MATTER

Appellant's network distributes the cable modem termination system functionality into two separate special-purpose unidirectional broadband cable modem components, which are installed at two different and distinct levels of the network, thereby to reduce the overall cost of serving the end user locations. In particular, this architecture centralizes the single-point to multi-point function of the downstream signaling while simultaneously localizing the multi-point to single-point functions of the upstream signaling by using a unidirectional "upstream broadband cable modem component," which functions to exclusively convert data that is received in a radio frequency based format from selected end user locations to data in a digital base-band IP format for transmission to the head-end, and a unidirectional "downstream broadband cable modem component," which functions to exclusively convert data that is received in a digital base-band IP format from a source of program material located at the head-end to data in a radio frequency based format for transmission to selected end user locations. The communications network is a multi-level hierarchical network, and the upstream broadband cable modem components are placed in this multi-level hierarchical network at a level in the network that is different than the downstream broadband cable modem components, such that the multiplexing and demultiplexing that is effected by these respective broadband cable modem components occurs at different levels of the multi-level hierarchical network.

The significance of this distribution of functionality is that the upstream broadband cable modem components serve to distribute traffic among a large number of end user locations, and the data communications traffic to the end user locations is significantly greater than the data communications traffic generated by the end user locations and transmitted to the multi-level hierarchical network. Thus, typically, there is a need for far more downstream broadband cable modem components in a multi-level hierarchical network than upstream broadband cable modem components. This disparity in numbers represents a cost savings over existing networks where each bidirectional cable modem termination system was equipped with both the upstream and downstream broadband cable modem components as



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an integral device and also enables the growth of the network to occur incrementally as end user locations are added and traffic is generated.

### Independent Claim 1

1. A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of end user locations (141-149 of Figures 3 and 4) that are connected to a first side of said network (Secondary Hub, 131-137 of Figures 3 and 4) and a head-end (111-113 of Figures 3 and 4) via a cable modem that is connected on a second side of said network (Primary Hub, 121-125 of Figures 3 and 4), said broadband network comprising a hierarchical network having at least two levels, said broadband cable modem termination system comprising:

downstream broadband cable modem component means (page 6, line 28 – page 7, line 12; 303, 304 of Figure 3; and 403, 404 of Figure 4), located at a first level of said hierarchical network, which is proximate to said second side of said network (Primary Hub, 121-125 of Figures 3 and 4), comprising:

means for exclusively converting data (page 7, line 26 – page 8, line 2; 503-507 of Figure 5) that is received in digital base-band IP format from a source of program material located at said head-end (111-113 of Figures 3 and 4), to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4),

means for transmitting (page 7, line 28 – page 8, line 6; 508-509 of Figure 5) said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

upstream broadband cable modem component means (page 5, line 30 – page 6, line 27; 301, 302 of Figure 3; and 401, 402 of Figure 4), located at a second level of said hierarchical network which is proximate to said first side of said network (Secondary Hub, 131-137 of Figures 3 and 4) and independent of said downstream broadband cable modem component means (303, 304 of Figure 3; and 403, 404 of Figure 4), comprising:

means for exclusively converting data (page 8, lines 14 – 17; 605-606 of Figure 6; page 8, lines 22 – 26; 401-1 to 401-3 of Figure 7) that is received in a radio frequency based format from selected ones of said plurality of end user locations (141-149 of Figures 3 and 4), to data in digital base-band IP format for transmission to said head-end (111-113 of Figures 3 and 4),

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means for transmitting (page 8, lines 17 – 21; 601-604 of Figure 6; page 8, line 29 – page 9, line 9; 703-706 of Figure 7) said data in digital base-band IP format exclusively through said network to said head-end (111-113 of Figures 3 and 4); and

wherein said first level and said second level are different levels in said hierarchical network (page 5, lines 18 – 29) and said means for exclusively converting data (503-507 of Figure 5) from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data (605-606 of Figure 6; 401-1 to 401-3 of Figure 7) from a radio frequency based format to data in digital base-band IP format.

#### Independent Claim 6

6. A method of operating a broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of end user locations (141-149 of Figures 3 and 4) that are connected to a first side of said network (Secondary Hub, 131-137 of Figures 3 and 4) and a head-end (111-113 of Figures 3 and 4) via a cable modem that is connected on a second side of said network, said broadband network comprising a hierarchical network having at least two levels, said method of operating a broadband cable modem termination system comprising:

exclusively converting data (page 7, line 26 – page 8, line 2; 503-507 of Figure 5) that is received in digital base-band IP format from a source of program material located at said head-end (111-113 of Figures 3 and 4), to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

transmitting (page 7, line 28 – page 8, line 6; 508-509 of Figure 5) said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

exclusively converting data (page 8, lines 14 – 17; 605-606 of Figure 6; page 8, line 22 – 26; 401-1 to 401-3 of Figure 7) that is received in a radio frequency based format from selected ones of said plurality of end user locations (141-149 of Figures 3 and 4), to data in digital base-band IP format for transmission to said head-end (111-113 of Figures 3 and 4);

transmitting (page 8, lines 17 – 21; 601-604 of Figure 6; page 8, line 29 – page 9, line 9; 703-706 of Figure 7) said data in digital base-band IP format exclusively through said network to said head-end (111-113 of Figures 3 and 4); and

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wherein said primary hubs (Primary Hub, 121-125 of Figures 3 and 4) and said secondary hubs (Secondary Hub, 131-137 of Figures 3 and 4) are located at different levels in said broadband network (page 5, lines 18 - 29) and said step of exclusively converting data (503-507 of Figure 5) from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data (605-606 of Figure 6; 401-1 to 401-3 of Figure 7) from a radio frequency based format to data in digital base-band IP format.

#### Independent claim 11

11. A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a head-end (111-113 of Figures 3 and 4) that is connected to a plurality of primary hubs (121-125 of Figures 3 and 4) of said broadband network, and a plurality of end user locations (141-149 of Figures 3 and 4) that are connected to a plurality of secondary hubs (131-137 of Figures 3 and 4) of said broadband network, said broadband network interconnecting said primary (121-125 of Figures 3 and 4) and said secondary hubs (131-137 of Figures 3 and 4), said broadband cable modem termination system comprising:

primary hub broadband cable modem component means (page 6, line 28 - page 7, line 12; 303, 304 of Figure 3; and 403, 404 of Figure 4), connected to at least one of said primary hubs (121-125 of Figures 3 and 4), comprising:

means for exclusively converting data (page 7, line 26 - page 8, line 2; 503-507 of Figure 5) that is received in digital base-band IP format from a source of program material located at said head-end (111-113 of Figures 3 and 4) to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4),

means for transmitting (page 7, line 28 - page 8, line 6; 508-509 of Figure 5) said data in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

secondary hub broadband cable modem component means (page 5, line 30 - page 6, line 27; 301, 302 of Figure 3; and 401, 402 of Figure 4), connected to at least one of said secondary hubs (131-137 of Figures 3 and 4) and independent of said primary hub broadband cable modem component means (303, 304 of Figures 3 and 4), comprising:

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means for exclusively converting data (page 8, lines 14 – 17; 605-606 of Figure 6; page 8, lines 22 – 26; 401-1 to 401-3 of Figure 7) that is received in a radio frequency based format from selected ones of said plurality of end user locations (141-149 of Figures 3 and 4) to data in digital base-band IP format for transmission to said head-end (111-113 of Figures 3 and 4);

means for transmitting (page 8, lines 17 – 21; 601-604 of Figure 6; Page 8, line 29 – page 9, line 9; 703-706 of Figure 7) said data in digital base-band IP format exclusively through said network to said head-end (111-113 of Figures 3 and 4); and

wherein said primary hubs (121-125 of Figure 3 and 4) and said secondary hubs (131-137 of Figures 3 and 4) are located at different levels in said broadband network (page 5, lines 18 – 29), and said means for exclusively converting data (503-507 of Figure 5) from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data (605-606 of Figure 6; 401-1 to 401-3 of Figure 7) from a radio frequency based format to data in digital base-band IP format.

#### Independent claim 15

15. A method for managing data transmissions through a broadband network that interconnects a head-end (111-113 of Figures 3 and 4) that is connected to a plurality of primary hubs (121-125 of Figures 3 and 4) of said broadband network, and a plurality of end user locations (141-149 of Figures 3 and 4) that are connected to a plurality of secondary hubs (131-137 of Figures 3 and 4) of said broadband network, said broadband network interconnecting said primary (121-125 of Figures 3 and 4) and said secondary hubs (131-137 of Figures 3 and 4), said broadband cable modem termination system comprising:

operating a primary hub broadband cable modem component (page 6, line 28 – page 7, line 12; 303, 304 of Figure 3; and 403, 404 of Figure 4) that is connected to at least one of said primary hubs (121-125 of Figures 3 and 4), comprising:

exclusively converting data (page 7, line 26 – page 8, line 2; 503-507 of Figure 5) that is received in digital base-band IP format from a source of program material located at said head-end (111-113 of Figures 3 and 4) to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

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transmitting said data (page 7, line 28 – page 8, line 6; 508-509 of Figure 5) in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations (141-149 of Figures 3 and 4);

operating a secondary hub broadband cable modem component (page 5, line 30 – page 6, line 27; 301, 302 of Figures 3 and 4) that is connected to at least one of said secondary hubs (131-137 of Figures 3 and 4) and independent of said primary hub broadband cable modem component (303, 304 of Figure 3; and 403, 404 of Figure 4), comprising:

exclusively converting data (page 8, lines 14 – 17; 605-606 of Figure 6; Page 8, lines 22 – 26; 401-1 to 401-3 of Figure 7) that is received in a radio frequency based format from selected ones of said plurality of end user locations (141-149 of Figures 3 and 4) to data in digital base-band IP format for transmission to said head-end (111-113 of Figures 3 and 4);

transmitting (page 8, lines 17 – 21; 601-604 of Figure 6; page 8, line 29 – page 9, line 9; 703-706 of Figure 7) said data in digital base-band IP format exclusively through said network to said head-end (111-113 of Figures 3 and 4); and

wherein said primary hubs (121-125 of Figures 3 and 4) and said secondary hubs (131-137 of Figures 3 and 4) are located at different levels in said broadband network (page 5, lines 18 – 29), and said step of exclusively converting data (503-507 of Figure 5) from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data (605-606 of Figure 6; 401-1 to 401-3 of Figure 7) from a radio frequency based format to data in digital base-band IP format.

#### 6.) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issue to be reviewed on appeal is whether the final rejection of claims 1, 6, and 11 – 24 under 35 USC 102(b) as being anticipated by Appellant's admitted prior art system as disclosed in Figure 2 of the disclosure should be reversed.

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7.) ARGUMENT

I. Examiner's Position - Rejection Of Claims 1, 6, And 11 - 24 Under 35 U.S.C. §102(B)

The Examiner rejected claims 1, 6, and 11 - 24 under 35 USC §102(b) as being anticipated by Appellant's admitted prior art system as disclosed in Figure 2 of the disclosure, noting with respect thereto:

In regards to claims 1 and 6, Appellant's prior art system as illustrated in figure 2 and disclosure in page 4, line 2 - page 5, line 11 discloses a broadband cable modem termination system for managing data transmission through a broadband network that interconnects a plurality of end user locations that are connected to a first side of the network and a head-end (111) via a cable modem that is connected on a second side of the network, the broadband network comprising a hierarchical network having at least two levels, the CMTS comprising:

Downstream broadband cable modem component means (downstream component of CMTS in 107), located at a first level of the hierarchical network, which is proximate to the second side of the network, comprising:

Means for exclusively converting data (CMTS is located at PFN 143, therefore exclusively converted at the PFN) that is received in digital base-band IP format from a source of program material located at the head-end (111), to data in a RF based format for transmission to selected ones of plurality of end user locations (users served by PFN 143),

Means for transmitting data in the RF based format exclusively through the network to selected ones of plurality of end user locations (i.e., users served by PFN 143);

Upstream broadband cable modem component means (upstream component of CMTS 108) located at a second level of said hierarchical network which is proximate to the first side of the network and independent of the downstream broadband cable modem component means, comprising:

Means for exclusively converting data (CMTS is located at PFN 144 and therefore exclusively converts data at the PFN) that is received in a radio frequency based format from selected ones of said plurality of end user locations, to data in digital base-band IP format for transmission to the head-end (111),

Means for transmitting data in digital base-band IP format exclusively through the network to the head-end; and

Wherein the first and the second level are different levels in the hierarchical network and the means for exclusively converting data from the digital base-band IP format to data in a RF based format is at different location from the means for

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exclusively converting data from a radio frequency based format to data in digital base-band IP format (107 and 108 are at different locations).

## **II. Appellant's Position**

Appellant submits that the 35 U.S.C. §102(b) rejection of claims 1, 6, and 11 – 24 set forth in the Final Office Action dated 19 October 2006 fails to set forth a prima facie showing of either anticipation or obviousness because the Examiner has failed to cite and apply references which contain all of the claimed elements or limitations of Appellant's claimed invention.

In addition, the Examiner's final rejection of claims 6 and 21 – 24 under 35 USC §112, second paragraph, represents a minor correction and can be addressed in an Amendment once this Appeal is decided.

## **III. Appellant's Characterization Of The Reference**

Appellant's invention represents a novel architecture for data communication networks that serve end user locations. In existing data communication networks, the cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends. The use of this either/or network implementation provided consistence of placement of cable modem termination systems, which simplified both maintenance and network management, and also used only a single ubiquitous bidirectional cable modem termination system in every site.

In addition, the original broadband cable transmission systems were engineered to provide a one-way distribution of video program material from the cable head-end to the end user locations; therefore, 95% of the available data transmission bandwidth in these broadband cable networks is dedicated to transmissions from the cable head-end to the end user locations. The upstream path of the broadband cable network, therefore, is a critical resource which limits the number of end user locations that can be served by a particular cable modem termination system and also limits the number and nature of new interactive services that can be offered to the end user locations. Therefore, existing service offerings are limited to those which place a minimal demand on the upstream communication capabilities of the broadband cable network. In addition, service providers have limited the number of end user locations that can be served by each passive fiber node in the broadband cable network to enable the

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upstream channel to serve these end user locations. Therefore, the bandwidth limitation of the upstream channel in the broadband cable network represents a service offering limitation and an inefficiency in terms of the number of end user locations that can be served.

Appellant acknowledged the above-described implementation of existing networks in the specification of this application, and the Examiner has used this description as the basis for rejecting Appellant's claims. However, the Examiner extrapolates the prior art noted by Appellant now to suggest placing bidirectional cable modem termination systems at multiple levels of the network, although there is no suggestion to do so in the prior art, since the prior art implements an either/or scheme of placing the bidirectional cable modem termination system in the cable head-ends or in the primary hubs that are connected to the cable head-ends. In addition, this particular placement of bidirectional devices fails to address Appellant's claimed unidirectional upstream and downstream broadband cable modem components.

#### **IV. Lack of Prima Facie Anticipation**

The courts and the MPEP have stated that: "To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter." *PPG Industries, Inc. v Guardian Industrial Corp.*, 75 F.3d 1558, 1566, 37 USPQ2d 1618, 1624.

Appellant believes that the Examiner has not made a prima facie showing of anticipation for the claimed invention under 35 U.S.C. §102(b) since the Examiner has not met any of the requirements of this test, as is shown below.

#### **V. Comparison Of The Claims With The Prior Art Illustrating The Failure Of The Prior Art To Disclose All Of The Limitations Of The Claimed Invention**

As noted above in Sections III and IV, in order to support a prima facie case of anticipation or obviousness, the cited references must show all of the limitations of the claimed invention. The independent claims are claims 1, 6, 11, and 15. The following analysis of the claims is summarized in claim chart form with regard to the independent claims 1, 6, 11, and 15; and these claim charts and the following analysis show that the cited references fail to show all of the limitations of the claimed invention. All of the remaining claims depend on independent claims 1, 6, 11, or 15 and, therefore, are



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distinguishable over the prior art in the same manner as the independent claims, so these claims are not discussed in detail for the sake of brevity.

## VI. Claim Charts

The following claim charts compare Appellant's independent claims 1, 6, 11, and 15 with the cited prior art that was noted above and relied upon by the Examiner in the rejection of claims 1, 6, and 11 - 24 under 35 USC §102(b), with the elements of Appellant's claims 1, 6, 11, and 15 not shown in the cited prior art being underlined. The failure of this reference to teach all of the elements recited in claims 1, 6, 11, and 15 supports Appellant's position that the Examiner has failed to make a prima facie showing of anticipation under 35 U.S.C. §102(b), thereby rendering claims 1, 6, and 11 - 24 allowable.

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#### Appellant's Claim 1

A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of end user locations that are connected to a first side of said network and a head-end via a cable modem that is connected on a second side of said network, said broadband network comprising a hierarchical network having at least two levels, said broadband cable modem termination system comprising:

downstream broadband cable modem component means, located at a first level of said hierarchical network, which is proximate to said second side of said network, comprising:

means for exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations,

means for transmitting said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations;

upstream broadband cable modem component means, located at a second level of said hierarchical network which is proximate to said first side of said network and independent of said downstream broadband cable modem component means, comprising:

means for exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations, to data in digital base-band IP format for transmission to said head-end,

means for transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said first level and said second level are different levels in said hierarchical network and said means for exclusively converting data from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data from a radio frequency based format to data in digital base-band IP format.

#### Prior Art

Existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends. The use of this either/or network implementation provided consistency of placement of cable modem termination systems, which simplified both maintenance and network management and also used only a single ubiquitous bidirectional cable modem termination system in every site.

One version of existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends.

Existing head-end cable modems typically include converters which convert data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of the plurality of end user locations.

Existing cable modem termination systems typically include transmitters for transmitting said data in radio frequency based format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network.

Existing cable modem termination systems typically include converters which convert data that is received in a radio frequency based format from selected ones of the plurality of end user locations, to data in digital base-band IP format for transmission to head-ends.

Existing cable modem termination systems typically include transmitters for transmitting said data in digital base-band IP format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network, for exclusively converting data from digital base-band IP format to data in a radio frequency based format at a different network level from exclusively converting data from a radio frequency based format to data in digital base-band IP format.

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#### Appellant's Claim 6

6. A method of operating a broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of end user locations that are connected to a first side of said network and a head-end via a cable modem that is connected on a second side of said network, said broadband network comprising a hierarchical network having at least two levels, said method of operating a broadband cable modem termination system comprising:

exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations;

transmitting said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations;

exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations, to data in digital base-band IP format for transmission to said head-end;

transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network and said step of exclusively converting data from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data from a radio frequency based format to data in digital base-band IP format.

#### Prior Art

Existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends. The use of this either/or network implementation provided consistence of placement of cable modem termination systems, which simplified both maintenance and network management and also used only a single ubiquitous bidirectional cable modem termination system in every site.

One version of existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends.

Existing cable modem termination systems typically include transmitters for transmitting said data in radio frequency based format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network.

Existing cable modem termination systems typically include transmitters for transmitting said data in digital base-band IP format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network, for exclusively converting data from digital base-band IP format to data in a radio frequency based format at a different network level from exclusively converting data from a radio frequency based format to data in digital base-band IP format.

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# Appellant's Claim 11

11. A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a head-end that is connected to a plurality of primary hubs of said broadband network, and a plurality of end user locations that are connected to a plurality of secondary hubs of said broadband network, said broadband network interconnecting said primary and said secondary hubs, said broadband cable modem termination system comprising:

primary hub broadband cable modem component means, connected to at least one of said primary hubs, comprising:

means for exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations,

means for transmitting said data in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations;

secondary hub broadband cable modem component means, connected to at least one of said secondary hubs, and independent of said primary hub broadband cable modem component means, comprising:

means for exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations to data in digital base-band IP format for transmission to said head-end;

means for transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network, and said means for exclusively converting data from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data from a radio frequency based format to data in digital base-band IP format.

## Prior Art

Existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends. The use of this either/or network implementation provided consistency of placement of cable modem termination systems, which simplified both maintenance and network management and also used only a single ubiquitous bidirectional cable modem termination system in every site.

One version of existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends.

Existing head end cable modems typically include converters which convert data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of the plurality of end user locations.

Existing cable modem termination systems typically include transmitters for transmitting said data in radio frequency based format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network.

Existing cable modem termination systems typically include converters which convert data that is received in a radio frequency based format from selected ones of the plurality of end user locations, to data in digital base-band IP format for transmission to head-ends.

Existing cable modem termination systems typically include transmitters for transmitting said data in digital base-band IP format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network, for exclusively converting data from digital base-band IP format to data in a radio frequency based format at a different network level from exclusively converting data from a radio frequency based format to data in digital base-band IP format.

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# Appellant's Claim 15

15. A method for managing data transmissions through a broadband network that interconnects a head-end that is connected to a plurality of primary hubs of said broadband network, and a plurality of end user locations that are connected to a plurality of secondary hubs of said broadband network, said broadband network interconnecting said primary and said secondary hubs, said broadband cable modem termination system comprising:

operating a primary hub broadband cable modem component that is connected to at least one of said primary hubs, comprising:

exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations;

transmitting said data in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations;

operating a secondary hub broadband cable modem component that is connected to at least one of said secondary hubs and independent of said primary hub broadband cable modem component, comprising:

exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations to data in digital base-band IP format for transmission to said head-end;

transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network, and said step of exclusively converting data from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data from a radio frequency based format to data in digital base-band IP format.

## Prior Art

Existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends. The use of this either/or network implementation provided consistence of placement of cable modem termination systems, which simplified both maintenance and network management and also used only a single ubiquitous bidirectional cable modem termination system in every site.

One version of existing cable modem termination systems are centrally located in the cable head-ends or in the primary hubs that are connected to the cable head-ends.

Existing head end cable modems typically include converters which convert data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of the plurality of end user locations.

Existing cable modem termination systems typically include transmitters for transmitting said data in radio frequency based format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network.

Existing cable modem termination systems typically include converters which convert data that is received in a radio frequency based format from selected ones of the plurality of end user locations, to data in digital base-band IP format for transmission to head-ends.

Existing cable modem termination systems typically include transmitters for transmitting said data in digital base-band IP format.

Existing cable modem termination systems do not include two sets of unidirectional cable modems, located at two different levels of the broadband network, for exclusively converting data from digital base-band IP format to data in a radio frequency based format at a different network level from exclusively converting data from a radio frequency based format to data in digital base-band IP format.

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Thus, as illustrated by the above claim charts, the cited prior art fails to disclose all of the elements that are recited in any of Appellant's independent claims 1, 6, 11, and 15.

#### VII. Anticipation Rejection Of Appellant's Claims

In order to support an anticipation rejection of Appellant's claims under 35 U.S.C. §102(b), the Examiner must cite a reference that teaches all of the limitations recited in Appellant's claims. This rule is typically cited as:

"To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter." *PPG Industries, Inc. v Guardian Industrial Corp.*, 75 F.3d 1558, 1566, 37 USPQ2d 1618, 1624.

In reviewing the Examiner's comments, it should be noted that Appellant's disclosure teaches:

In the architecture of Figure 1, the cable modem termination system 105, 106 is located in the primary hubs 121-125, while in the architecture of Figure 2, the cable modem termination system 107, 108 is located in the passive fiber nodes 141-149.

There is no suggestion in the prior art of splitting the cable modem termination system into separate upstream and downstream components, and the Examiner simply selects a complete cable modem termination system as an "upstream" example and another complete cable modem termination system as a "downstream" example. However, Figures 1 and 2 fail to show either an upstream or a downstream component of the cable modem termination system operating at one level of the network exclusive of the presence of the other component. Appellant's claim language in independent claim 1, for example, recites "downstream broadband cable modem component means" and "upstream broadband cable modem component means" as two separate elements, located at different levels of the hierarchical network. The independent claims also specifically note the physical separation of the operating components of the cable modem termination system as was intended.

These claims are believed allowable over the prior art cable modem termination systems of Figures 1 and 2, since these figures fail to show or suggest splitting each cable modem termination

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system into their upstream and downstream components and siting these components at different levels of the network to obtain the benefits noted in the specification.

As noted in Appellant's specification (page 1, line 27 - page 2, line 12):

The above described problems are solved and a technical advance achieved by the distributed broadband cable modem termination system which centralizes the point to multi-point function of the downstream signaling while simultaneously localizing the multi-point to single point functions of the upstream signaling. The upstream broadband cable termination segment of the broadband cable modem termination system is located at a different layer of the broadband cable network from the downstream broadband cable modem termination segment of the broadband cable modem termination system.

By splitting the broadband cable modem termination system functions into separable and independently operable upstream and downstream functions, network deployment is optimized for a number of reasons. The downstream and upstream functions scale independently so the system can selectively add capacity where needed in the direction needed independent of the capacity in the reverse direction. In addition, this architecture provides additional flexibility by supporting a number of concurrently operational implementations. Within a single broadband cable network, the upstream and downstream segments of the broadband cable modem termination system can be located at different layers of the broadband cable network as long as the interconnected upstream and downstream segments of the broadband cable modem termination system for a particular communication path are at different levels of the broadband cable network.

Thus, Appellant believes that independent claim 1 is allowable under 35 U.S.C. §102(b) over the prior art cable modem termination systems as shown in Figures 1 and 2 of Appellant's specification. In addition, independent claims 6, 11, and 15 are analogous in scope to independent claim 1 and are believed allowable for the reasons noted above with respect to independent claim 1. In addition, Appellant believes that dependent claims 12 - 14 and 16 - 24 are also allowable under 35 U.S.C. §102(b) over the prior art cable modem termination systems as shown in Figures 1 and 2 of Appellant's specification, since these claims depend on allowable base claims.

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## VIII. Summary

Appellant believes that claims 1, 6, and 11 – 24 are allowable under 35 U.S.C. §102(b) over the cited reference and under 35 U.S.C. §112(b) for the reasons articulated above.

In view of the above remarks, Appellant believes the pending application is in condition for allowance. If the Examiner fails to concur, the undersigned respectfully requests that the Examiner detail such disagreement with specificity to provide clear issues for appeal. Appellant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 50-1848, under Order No. 013436.0235PTUS from which the undersigned is authorized to draw.

Respectfully submitted,  
PATTON BOGGS LLPDated: 05 February 2007By: James M. Graziano  
James M. Graziano  
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8.) CLAIMS APPENDIX

1. (Previously presented) A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of end user locations that are connected to a first side of said network and a head-end via a cable modem that is connected on a second side of said network, said broadband network comprising a hierarchical network having at least two levels, said broadband cable modem termination system comprising:

downstream broadband cable modem component means, located at a first level of said hierarchical network, which is proximate to said second side of said network, comprising:

means for exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations,

means for transmitting said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations;

upstream broadband cable modem component means, located at a second level of said hierarchical network which is proximate to said first side of said network and independent of said downstream broadband cable modem component means, comprising:

means for exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations, to data in digital base-band IP format for transmission to said head-end,

means for transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said first level and said second level are different levels in said hierarchical network and said means for exclusively converting data from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data from a radio frequency based format to data in digital base-band IP format.

Claims 2 - 5 (Canceled)

6. (Previously presented) A method of operating a broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a plurality of

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end user locations that are connected to a first side of said network and a head-end via a cable modem that is connected on a second side of said network, said broadband network comprising a hierarchical network having at least two levels, said method of operating a broadband cable modem termination system comprising:

exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end, to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations;

transmitting said data in said radio frequency based format exclusively through said network to selected ones of said plurality of end user locations;

exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations, to data in digital base-band IP format for transmission to said head-end;

transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network and said step of exclusively converting data from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data from a radio frequency based format to data in digital base-band IP format.

Claims 7 – 10 (Canceled)

11. (Previously presented) A broadband cable modem termination system for managing data transmissions through a broadband network that interconnects a head-end that is connected to a plurality of primary hubs of said broadband network, and a plurality of end user locations that are connected to a plurality of secondary hubs of said broadband network, said broadband network interconnecting said primary and said secondary hubs, said broadband cable modem termination system comprising:

primary hub broadband cable modem component means, connected to at least one of said primary hubs, comprising:

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means for exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations,

means for transmitting said data in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations;

secondary hub broadband cable modem component means, connected to at least one of said secondary hubs and independent of said primary hub broadband cable modem component means, comprising:

means for exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations to data in digital base-band IP format for transmission to said head-end;

means for transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network, and said means for exclusively converting data from digital base-band IP format to data in a radio frequency based format is at a different location from said means for exclusively converting data from a radio frequency based format to data in digital base-band IP format.

12. (Previously presented) The broadband cable modem termination system of claim 11 further comprising:

wherein a plurality of end user locations are served by a passive fiber node which serves to interconnect said plurality of end user locations to a secondary hub, said secondary hub broadband cable modem component means is located in said passive fiber node.

13. (Previously presented) The broadband cable modem termination system of claim 11 wherein said means for exclusively converting data that is received in a radio frequency based format comprises:

means for converting said radio frequency based format data from a DOCSIS IP format to digital base-band IP format data.

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14. (Previously presented) The broadband cable modem termination system of claim 11 wherein said means for exclusively converting data that is received in digital base-band IP format comprises:

means for converting said digital base-band IP format data to DOCSIS IP data.

15. (Previously presented) A method for managing data transmissions through a broadband network that interconnects a head-end that is connected to a plurality of primary hubs of said broadband network, and a plurality of end user locations that are connected to a plurality of secondary hubs of said broadband network, said broadband network interconnecting said primary and said secondary hubs, said broadband cable modem termination system comprising:

operating a primary hub broadband cable modem component that is connected to at least one of said primary hubs, comprising:

exclusively converting data that is received in digital base-band IP format from a source of program material located at said head-end to data in a radio frequency based format for transmission to selected ones of said plurality of end user locations;

transmitting said data in said radio frequency based format exclusively through said broadband network to selected ones of said plurality of end user locations;

operating a secondary hub broadband cable modem component that is connected to at least one of said secondary hubs and independent of said primary hub broadband cable modem component, comprising:

exclusively converting data that is received in a radio frequency based format from selected ones of said plurality of end user locations to data in digital base-band IP format for transmission to said head-end;

transmitting said data in digital base-band IP format exclusively through said network to said head-end; and

wherein said primary hubs and said secondary hubs are located at different levels in said broadband network, and said step of exclusively converting data from digital base-band IP format to data in a radio frequency based format occurs at a different location from said step of exclusively converting data from a radio frequency based format to data in digital base-band IP format.

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16. (Previously presented) The method for managing data transmissions through a broadband network of claim 15 further comprising:

wherein a plurality of end user locations are served by a passive fiber node which serves to interconnect said plurality of end user locations to a secondary hub, said step of exclusively converting data that is received in a radio frequency based format is executed in said passive fiber node.

17. (Previously presented) The method for managing data transmissions through a broadband network of claim 15 wherein said step of exclusively converting data that is received in a radio frequency based format comprises:

converting said radio frequency based format data from a DOCSIS IP format to digital base-band IP format data.

18. (Previously presented) The method for managing data transmissions through a broadband network of claim 15 wherein said step of exclusively converting data that is received in digital base-band IP format comprises:

converting said digital base-band IP format data to DOCSIS IP data.

19. (Previously presented) The broadband cable modem termination system of claim 1 further comprising:

wherein a plurality of end user locations are served by a passive fiber node which serves to interconnect said plurality of end user locations to a secondary hub, said upstream broadband cable modem component means is located in said passive fiber node.

20. (Previously presented) The broadband cable modem termination system of claim 1 wherein said means for exclusively converting data that is received in a radio frequency based format comprises:

means for converting said radio frequency based format data from a DOCSIS IP format to digital base-band IP format data.

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21. (Previously presented) The broadband cable modem termination system of claim 1 wherein said means for exclusively converting data that is received in digital base-band IP format comprises:

means for converting said digital base-band IP format data to DOCSIS IP data.

22. (Previously presented) The method of operating a broadband cable modem termination system claim 6 further comprising:

wherein a plurality of end user locations are served by a passive fiber node which serves to interconnect said plurality of end user locations to a secondary hub, said step of exclusively converting data that is received in a radio frequency based format is executed in said passive fiber node.

23. (Previously presented) The method of operating a broadband cable modem termination system claim 6 wherein said step of exclusively converting data that is received in a radio frequency based format comprises:

converting said radio frequency based format data from a DOCSIS IP format to digital base-band IP format data.

24. (Previously presented) The method of operating a broadband cable modem termination system claim 6 wherein said step of exclusively converting data that is received in digital base-band IP format comprises:

converting said digital base-band IP format data to DOCSIS IP data.

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9.) EVIDENCE APPENDIX

None

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10.) RELATED PROCEEDINGS APPENDIX

None